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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/851,387	05/09/2001	Mitsuhiro Nada	205002US2	3902

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EXAMINER
VERBITSKY, GAIL KAPLAN

ART UNIT	PAPER NUMBER
2859	

DATE MAILED: 08/18/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/851,387	NADA, MITSUHIRO	
	Examiner	Art Unit	
	Gail Verbitsky	2859	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 May 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,7-10 and 14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,7-10 and 14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

1. Applicant's election of Species A (Claims 1-3, 7-10, 14) with traverse is hereby acknowledged. Applicant states that a search for elected species will also necessarily require a search for other species. Examiner respectfully disagrees with this statement, because a search required for the elected species (power semiconductor/ coolant) does not require a search in the area of electrical motors, as required by non-elected claims. Therefore, restriction/ election requirement is proper and thereby, made FINAL.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-3, 7-10, 14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In this case, the claim language is confusing because:

Claims 1-3, 7: it is not clear how step f) in claims 1-3 further limit the claims, since the preamble of the claims is directed to a method of estimating temperature, not detecting sensor's abnormality.

Claims 8-10, 14: the claim language is confusing because it is not clear how "detecting the abnormality of at least one of the detector" further limit the claims, since the preamble of the

claims is directed a temperature estimation device for estimating a temperature of one of first and second objects, not detecting a sensors' abnormality.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-3, 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mori et al. (U.S. 5778662) [hereinafter Mori] in view of Ito et al. (U.S. 4949078) [hereinafter Ito].

Mori discloses a device and a method of determining (estimating) temperature, the device comprises of a first object/ component (coolant/ heat sink), a second object/ component (power semiconductor/ transistor), wherein, before energization, both objects temperatures are equalized by the coolant. The method comprises determining/ measuring of the temperature of the coolant Ts (T_2) (first method). The computer adds the Ts (T_2) and Tds ($\triangle T$) which is the difference in temperatures between the coolant and the transistor and thus, estimates the temperature of the second object/ transistor (second method, different from the first method). Inherently, the both objects are positioned relatively close to each other and that in absence of a heat generation (energization) their temperatures equalize. Inherently, the temperature difference is related (characterizes) the amount of heat (energization) needed to energize (turn in) the transistor.

(delta T is also a specific value inherently indicating the amount of energy needed for energization of the transistor).

Mori does not teach to determine if the sensor is abnormal, as stated in claims 1-3 and 8-10.

Ito teaches to measure temperature of an object with a temperature sensor (first method), compare with a predetermined/ previously obtained/reference data (second method), concluding that the temperature sensor is malfunctioning (based on the first and second methods) and notifying a driver/ operator.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the data obtained from the first and the second methods, as taught by Ito, so as to determine if the sensor is malfunctioning, in order not only to assess the first and the second objects, but also to determine if the problem is in the sensor and the sensor needs to be replaced.

6. Claims 1-3, 8-10 are rejected under 35 U.S.C. 102(a) as being unpatentable over Takeda (U.S. 5923135) in view of Ito.

Takeda discloses a device and a method of determining (estimating) temperature, the device comprises a first object/ component (coolant), a second object/ component (power semiconductor), wherein, before energization, both objects temperatures are equalized by the coolant. The coolant temperature Tc (T_2) is being detected by a temperature sensor 20

(first method). A temperature of the semiconductor (junction) is being determined/ estimated by a formula Tj= P· 01 +Tc, (second method different from the first method), wherein, P· 01 (ΔT or increment) indicates the amount of energization needed for junction (specific value). It is inherent that ΔT should be determined prior to incorporating it into the formula shown above. There is an estimator to estimate the junction (T_1) temperature.

Takeda does not teach to determine if the sensor is abnormal, as stated in claims 1-3 and 8-10.

Ito teaches to measure temperature of an object with a temperature sensor (first method), compare with a predetermined/ previously obtained/reference data (second method), concluding that the temperature sensor is malfunctioning (based on the first and second methods) and notifying a driver/ operator.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the data obtained from the first and the second methods, as taught by Ito, so as to determine if the sensor is malfunctioning, in order not only to assess the first and the second objects, but also to determine if the problem is in the sensor and the sensor needs to be replaced.

7. Claims 7 and 14 are rejected under 35 U.S.C. 102(a) as being unpatentable by Takeda and Ito as applied to claims 1-3, 8-10 above, and further in view of Eisenhardt and Molander (U.S. 6286996).

Takeda and Ito disclose the device as stated above in paragraph 6.

They do not explicitly teach measuring the temperature of the power semiconductor by a temperature sensor installed in the power semiconductor element/ second element/ transistor and a process of determining the temperature of the coolant when the transistor is inactive, as stated in claim 7, and a determination portion (temperature sensor to measure temperature of the power semiconductor), as stated in claim 14.

Eisenhardt discloses a device comprising a first object (coolant) to cool a second object (power semiconductor) wherein the power semiconductor temperature is being measured by a temperature sensor (temperature determination portion) integrated (installed) in the power semiconductor.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to integrate a temperature sensor in a power semiconductor of Takeda, as taught by Eisenhardt, so as to obtain instantaneous temperature measurement of the power semiconductor, in order to allow the operator to take immediate necessary actions if the power semiconductor fails.

Molander teaches to determine the temperature of the power semiconductor in an inactive state.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to determine the temperature of the power semiconductor in both, an

inactive state and an active, as taught by Molander, so as to determine the temperature change of the semiconductor, in order to assess its possible failure before the failure occurs (col. 2).

Response to Arguments

8 Applicant's arguments with respect to claims 1-3, 7-10, 14 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art cited in the PTO-892 and not mentioned above disclose related devices and methods.

10. Any inquiry concerning this communication should be directed to Examiner Verbitsky who can be reached at (703) 306-5473 Monday through Friday 7:30 to 4:00 ET.

Any inquiry of general nature should be directed to the Group Receptionist whose telephone number is (703) 308-0956.

GKV

August 08, 2003 *Gail Verbitsky, Patent Examiner, TC 2800*